

A REVISION OF THE SPIDER GENUS *SASON* SIMON (*SASONINAE*, *BARYCHELIDAE*, *MYGALOMORPHAE*) AND ITS HISTORICAL BIOGEOGRAPHY

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ABSTRACT

The barychelid spider genus *Sason* is revised and includes six valid species: the type species, *S. robustum* (O. P.-Cambridge 1883), *S. andamanicum* (Simon 1888), *S. colemani* sp. nov., *S. maculatum* (Roewer 1963), *S. pectinatum* Kulczyński 1908, and *S. seychellanicum* Simon 1898. *Sason cinctipes* (Pocock 1892) and *S. armatoris* Pocock 1900 are newly synonymized with *S. robustum* (O. P.-Cambridge 1883), and *Chrysopelma* Roewer 1963 with *Sason*. *Rhianus* (= *Rhianodes*) and *Monodontium* are transferred to the Barychelinae. *Sason* occurs in the Seychelles, India, Ceylon, the Andaman Islands, New Guinea, to the islands of the Northwestern Pacific, and in northern Australia. Its distribution is similar to that of other Indo-Pacific taxa; a vicariance hypothesis is proposed for its historical biogeography.

INTRODUCTION

Sason Simon 1887 is a very distinctive barychelid genus that has included six species distributed from the Seychelles in the western Indian Ocean, northwards in the Andaman Islands, in Ceylon, southern India, to New Guinea (Roewer 1942). In general appearance, these spiders resemble migids (Simon 1892). They are small, compact, and stout-legged, lack a strong rastellum and, unlike many barychelids, their eyes are usually not on a tubercle and the eye group is rectangular. The synonymy of *Sason* includes two generic names that allude to the regal appearance of the spider: *Sason*, an abbreviation of the biblical name Samson; and *Sarpedon*, (the first given name and a homonym) the legendary king at the siege of Troy (Bonnet 1954). Roewer (1963) described a new genus, *Chrysopelma*, from the Mariana Islands but judging by the number of genera mentioned in his discussion he was unable to determine the closest relative. *Sason* was not mentioned but is here considered its senior synonym.

The subfamily name Sasoninae derives from a tribe made by Simon (1892) solely for *Sason* but *Rhianodes* (= *Rhianus* Thorell but invalidly emended to *Rianus* by Simon), a putatively related genus of which Simon had seen no material, was listed as "*genus invisum et incertae sedis*" under the Sasoneae. Simon (1903) made no further comment about "*Rianus*." Roewer (1942) reflected Simon's initial decision by including *Rhianodes* in the Sasoninae and extended the group to include the New Guinea genus *Monodontium*. The description of

Monodontium Kulczyński followed that of *Sason pectinatum* but Kulczyński (1908) associated the former with *Barychelus* and therefore the Barychelinae. Since then, Benoit (1966, 1978) described further material of *Sason seychellanium*.

Most subsequent authors have followed Pocock (1903) who elevated Simon's Barychelinae to family rank and his tribes (including the Sasoneae) to subfamilies. According to Bristowe (1938), Kishida (1930) elevated the Sasoninae to a family without explanation. Benoit (1964) placed the Sasoninae in the synonymy of the Barychelinae but continued to recognize the other two barychelid subfamilies—Diplochelinae and Leptopelmatinae. Raven (1985) continued to maintain the Sasoninae as a subfamily of the Barychelidae.

MATERIALS AND METHODS

Except for eye data, given in ocular eyepiece units, all measurements are in millimeters. For brevity, several abbreviation techniques are used. Characters present in all species, e.g., scopulae on metatarsi and tarsi I and II, are stated only in the generic description. Only the presence of spines on legs is noted. Rather than repeat the measured interval or object, a numeral is used to denote the character. The numeral is followed by a comma and the value(s) of the interval(s) in that specimen. For eyes, numerals denote the following: 1, number of rows; 2, width of group at its midlength/head-width through the same point; 3, ratio of front width: back width: length; 4, ratio of AME: ALE: PME: PLE; 5, ratio of MOQ (median ocular quadrangle) front width: back width: length; 6, minimum eye interspaces of AME-AME, AME-ALE, ALE-PLE, ALE-ALE, PME-PLE, PME-PME, respectively.

Leg segments in spine descriptions are abbreviated to their first two letters: fe, femur; pa, patella; ti, tibia; me, metatarsus; ta, tarsus. Spine statements are standard for the Araneae; other techniques not mentioned above are given in Raven (1984).

Trichobothria: 1, approximate number per row and extent on tibiae; 2, approximate number and extent on metatarsi; 3, number of clavate (c) and filiform (f) on tarsi.

Spinnerets: 1-3, refer to posterior median spinnerets; 1, length; 2, mid-width; 3, separation of bases; 4-7 refer to lengths of segments of posterior lateral spinnerets; 4, basal; 5, middle; 6, apical; 7, total.

SYSTEMATICS

SASONINAE SIMON

Diagnosis.—The Sasoninae differ from most other barychelids by the combination of the conical apical segment of the posterior lateral spinnerets, very low or absent eye tubercle, and edentate paired claws of males, and from *Ammonius* by the presence of a row of cuspules on the labium in females and the short cymbium in males.

Apical segment of posterior lateral spinnerets short, conical. Four spinnerets. Eye group about twice as wide as long, not on distinct tubercle. Paired claws of males with few teeth in one row or bare.

Genera included.—*Sason* Simon 1887, *Cosmopelma* Simon 1889, and *Paracenobiopelma* Feio 1952.

Sason Simon

Sarpedon O. P.-Cambridge 1883:353. Type species by monotypy *Sarpedon robustum* O. P.-Cambridge 1883.

Sason Simon 1887:195. Replacement name for *Sarpedon* preoccupied in the Coleoptera by *Sarpedon* Bonvouloir 1870.

Satzicus Simon 1888:286. Type species by monotypy *Satzicus andamanicum* Simon 1888. First synonymized by Simon 1892.

Oecophloeus Pocock 1892:49. Type species by monotypy *Oecophloeus cinctipes* Pocock 1892. First synonymized by Simon, 1892.

Chrysopelma Roewer 1963:113. Type species by original designation *Chrysopelma maculata* Roewer 1963. **NEW SYNONYMY.**

Diagnosis.—*Sason* differs from *Paracenobiopelma* by the absence of a distinct clypeus, and from *Cosmopelma* by the presence of a line of cuspules on the anterior edge of the labium in females.

Description.—Small, strongly patterned spiders. Carapace glabrous but with numerous short bristles, especially in males. Caput low but arched medially. Thoracic region slopes down from broad, shallow, slightly procurved or recurved fovea. Eyes in three rows or two rows with strongly procurved front row. Back row more or less straight. Eye group about twice as wide as long, rectangular. Eye tubercle absent or low, and if present, usually excludes ALE. Clypeus absent. Chelicerae short, sloping, with one row of teeth on furrow. Rastellum absent or with two to four short spines. Maxillae rectangular; anterior lobe not differentiated; heel acute, rounded; few cuspules in females. Lyra absent. Labium rectangular, anterior edge straight, lateral edges almost parallel; males of some species and all females armed with stout cuspules in line. Cuspules on maxillae present or absent in males, always present in females. Sternum cordate with two or three pairs of small, oval to round sigilla touching margin, and on sloping edge. Labiosternal suture narrow, distinct. Legs stout, sometimes with distinct annulations. Leg formula 4123. Scopulae entire but thin for full length of metatarsi and tarsi I, II; divided, distal if present on metatarsi III, IV; divided, thin if present on tarsi III, IV. Spines generally weak, few in number; often present on femora, ventral patellae, rarely on metatarsi, never on tarsi. Preening combs absent. Tarsi of females short, stout. Palpal claw and paired claws without teeth or with one row of teeth in males and females. Claw tufts small, moderately dense but never conceal claws entirely. Trichobothria in two short rows extending to one-half to two-thirds of tibiae; distal group on metatarsi; broad band on tarsi. Tarsi with both filiform and clavate trichobothria; bothria corrugiform. Tarsal organ low, domed. Relative lengths of posterior lateral spinneret segments: basal>middle>apical; apical segment with distal cluster of spigots. Spermathecae with two receptacula, sometimes apically divided. Tibia I of males with prolateral distal spur bearing megaspines. Males palp: tibia short; cymbium short, truncate, undivided; bulb pyriform with tapering embolus.

Distribution and Natural History.—*Sason* is known from the Seychelles, the Andaman and Mariana Islands, southern India, Ceylon, northern Australia, and

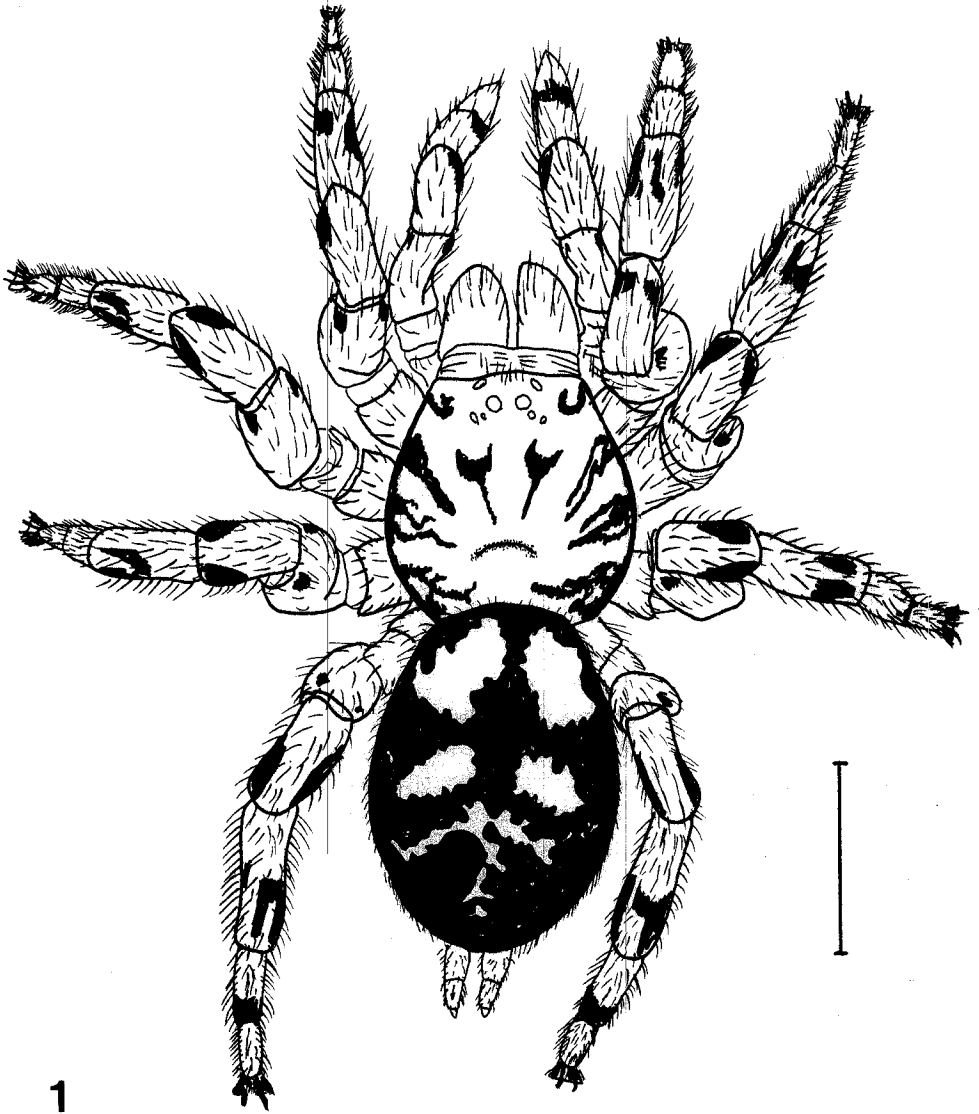


Fig. 1.—*Sason robustum* (O. P.-Cambridge), female, dorsal view. Scale line, 5 mm.

New Guinea. The retreat (fig. 19) consists of a very short tube with a door at each end (Pocock 1900, Coleman 1981). The outer surface of the retreat is usually impregnated with particles of soil and leaves.

Species included.—*Sason andamanicum* (Simon), *Sason colemani*, sp. nov., *Sason maculatum* (Roewer), *Sason pectinatum* Kulczyński, *Sason robustum* (O. P.-Cambridge), *Sason seychellanum* Simon.

Synonymy.—Roewer (1963) placed *Chrysopelma* in the Leptopelmatinae, considering it unique in the absence of a clypeus and teeth on the tarsal claws. However, Roewer's subfamilial placement appears to be based upon Petrunkevitch (1928) in which the key is erroneous through the "inversion" of one of the key couplets of Simon (1903). Simon (1903) separated the Sasoninae plus Leptopelmatinae by their "*area oculorum compactilis*;" whereas Petrunkevitch (1928) separated the Sasoninae from the Leptopelmatinae plus Barychelinae by

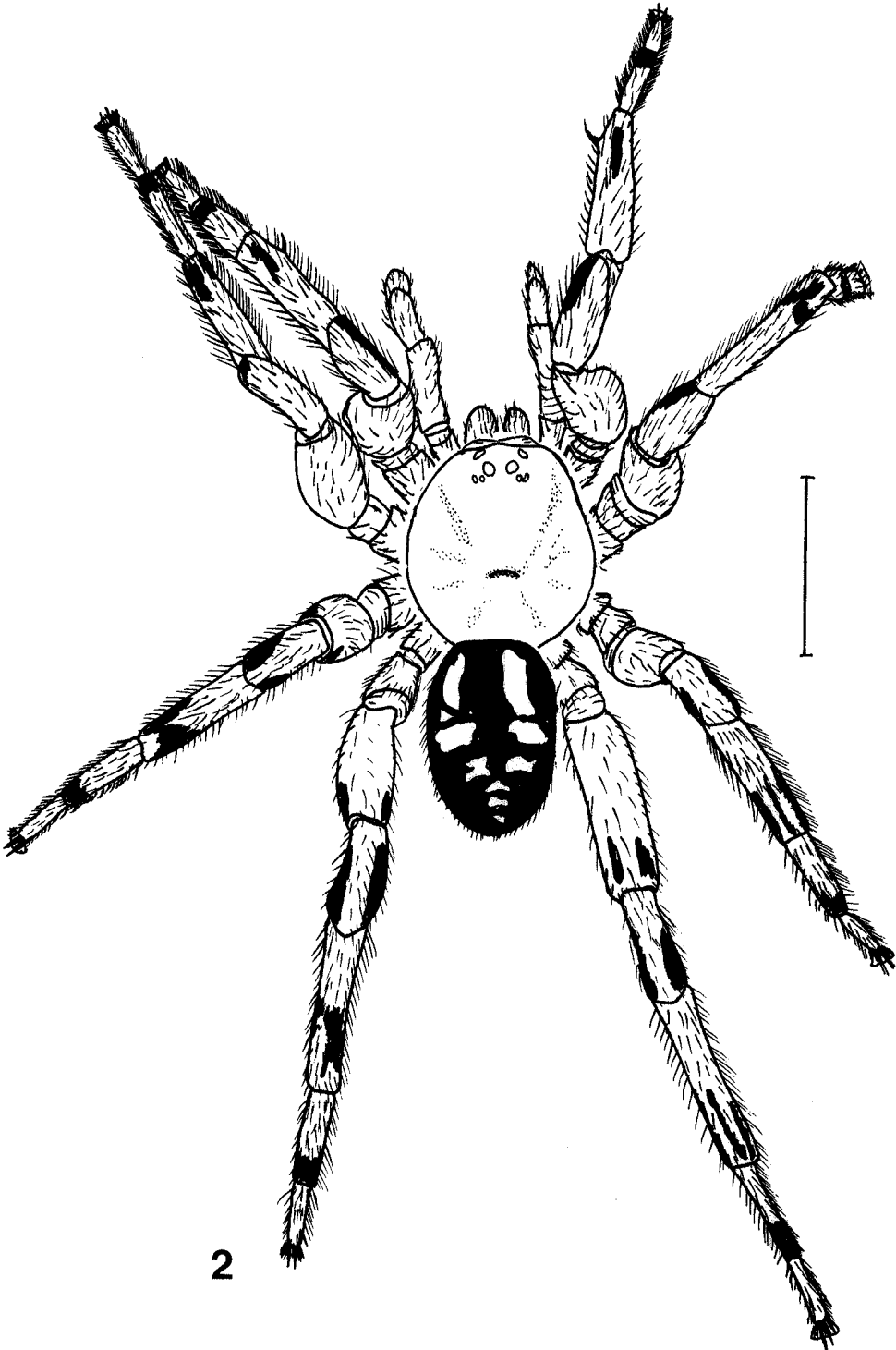


Fig. 2.—*Sason robustum* (O. P.-Cambridge), male, dorsal view. Scale line, 5 mm.

the non-compact eye group. Presumably, had Roewer (1963) used Simon (1903) *Chrysopelma maculata* would have been placed in or related to *Sason*.

Relationships.—*Sason* uniquely shares with *Paracenobiopelma* the line of cuspules on the anterior edge of the labium of females. (The maxillae have fewer cuspules than the labium.) Because that condition is unique in the Barychelidae, it is considered a synapomorphy and not a retention of the densely cusplated labium that is plesiomorphic in the Theraphosoidina (see Raven 1985). *Cosmopelma* shares with *Sason* and *Paracenobiopelma* the similarly patterned carapace, annulated legs, and broad chevrons on the abdomen—also unusual, if not unique, conditions in the barychelids. Associated with that character congruence, in both *Cosmopelma* and *Paracenobiopelma* the rectangular eye group is on a tubercle that is very low or absent and, unlike *Sason*, is separated from the edge of the carapace by a distinct clypeus. Males of *Paracenobiopelma* and *Sason* also share the absence of biserially dentate claws—a condition found widely in other barychelids and considered the family autapomorphy. Thus, one synapomorphy of *Sason* and *Paracenobiopelma* is presumed to be the reduced or edentate paired claws. Males of *Cosmopelma* are not known. The absence of a clypeus and abdominal pattern in *Cosmopelma dentata* Fischel 1927 (the type now lost) are sufficient to exclude it from the genus; the species may be correctly placed in *Trichopelma*. *Cosmopelma* lacks the linear cuspules of both *Sason* and *Paracenobiopelma*. Raven (1985) concluded that two hypotheses were equally parsimonious. First, either the linear cuspules were gained in the Sasoninae and lost only in *Cosmopelma*, and the clypeus was lost in the Sasoninae plus Barychelinae but regained in *Cosmopelma* and *Paracenobiopelma*. The second hypothesis is that the linear cuspules are synapomorphic for *Sason* plus *Paracenobiopelma* (one step) and that the clypeus was regained in each of *Paracenobiopelma* and *Cosmopelma* (two steps). Outgroup comparison supports the latter hypothesis that, internal to the Sasoninae, is unaffected by outgroup changes and uses two steps. The first, although also using two steps, is more parsimonious because one of the steps applies also to the Barychelinae. In either hypothesis the synapomorphies of the Sasoninae are the cephalic, leg, and abdominal patterns, plus the edentate claws of males, but the first hypothesis is correlated with the synapomorphy of the linear cuspules. If the presence of a clypeus is considered plesiomorphic, intrafamilial homoplasies of the shape and dentition of the labium and reduction of the posterior lateral spinnerets increase.

HISTORICAL BIOGEOGRAPHY OF *SASON*

The biogeography of *Sason* was little discussed when the genus was known only from areas within and around the Indian Ocean. Pocock (1903) believed that *Sason* arose near the Seychelles, India, and Ceylon prior to their separation "in very early times (p. 353)" but attributed their occurrence in the Andaman Islands to artificial introduction by man and suggested that the same may be true for their occurrence in the Seychelles. Legendre (1979) suggested that the arboreal nest of *Sason* allowed for its transport as flotsam in ocean currents. Raven (1980) admitted that possibility in mygalomorphs generally and suggested the most parsimonious mechanism would require that a gravid female made the voyage. Main (1981a) attributed the origin of much of Australia's mygalomorph fauna to

northern or southern invasions. In contrast, Kikkawa et al. (1981) found little support among distributions of birds, beetles, and butterflies for large scale invasions (through the Cape York corridor, at least). Williams (1981) also found the invasive component of Crustacea in Australia was very small. Coyle (1983, 1985) observed that two other mygalomorph genera, *Sphodros* and *Ummidia*, can disperse aerially and presented evidence that water gaps may be traversed during such ballooning.

Main (1981b), although stating that mygalomorphs generally have "poor powers of dispersal", later made the contradictory claim that the occurrence of mygalomorphs in New Guinea indicates that the groups "show exceptional capacity for dispersal or are ecologically aggressive with an unusually high invasive potential" (p. 587). Later, the theraphosids (accounting for about two-thirds of the known species of mygalomorphs and to which *Sason* was erroneously attributed) are considered "an extraordinarily "mobile" group (p. 589)." Neither the mechanism for the dispersal nor evidence for it has ever been presented.

Alone, the dispersal ability of a group is insufficient to support a dispersal explanation of their biogeography; areas of endemism (sometimes quite small) of birds, butterflies, and fish falsify that notion repeatedly. As Platnick (1981) points out, arachnologists have long been forced to concede the potential, however small, of spiders to disperse. Thus, some mygalomorphs may disperse beyond normal established ranges but that potential is not often realized. Clearly, once an organism transcends one barrier it could be expected to transcend all similar ones and so attain a very wide distribution.

Platnick (1981) rejected the need to consult dispersal abilities in discussing biogeographies; the degree of endemism is the most informative component. *Sason* species are endemic to relatively small areas. The species are morphologically distinct. Intrarelationships of *Sason* species should therefore reflect vicariance events in the historical biogeography of the genus.

Intrarelationships.—At present, two species groups are evident in *Sason*. *S. pectinatum* and *S. maculatum* share the back eye row being wider than the front (figs. 21, 27); and *S. andamanicum* and *S. colemani* share the "retreated" edge of the distal first tibia (figs. 9, 11) and the absence of labial cuspules of the male (figs. 7, 15). The plesiomorphic eye condition of barychelids is rectangular, thus the rhomboidal condition is apomorphic. In *S. robustum*, the cuticle at the base of the male tibial spur is not invaginated but the spur arises on a separate process (fig. 35); the spur is the same shape as in *S. andamanicum* and *S. colemani*. No spur is present in *Paracenobiopelma*, thus it cannot be used as an outgroup for this character. It is not possible to establish whether the spur was plesiomorphically distal and moved proximally with the resultant invagination closing over in *S. robustum*. The correlation of the invaginated tibial cuticle with the absence of cuspules (present in *Paracenobiopelma* and *S. robustum*) on the labium of males of *S. andamanicum* and *S. colemani* indicates that it is apomorphic; that is accepted here. Thus, three groups are evident: *S. robustum* and *S. seychellanium*, which lack a synapomorphy, *S. andamanicum* plus *S. colemani*, and *S. pectinatum* and *S. maculatum*. Without males of all species no further grouping is possible. I predict that a synapomorphy will be found linking *S. robustum* and *S. seychellanium*, and another linking *S. andamanicum* plus *S. colemani* and *S. pectinatum* plus *S. maculatum*.

At present, two areas of endemism (plus one default area) are recognizable: eastern Indian Ocean plus Australia, northwestern Pacific Ocean, and western Indian Ocean, respectively. Given an original widely spread southern occurrence, the rafting of India would have produced two of those areas (eastern and western Indian oceanic areas) and the uplifting of New Guinea would have produced the third. Hence, the areas are consistent with geological events. Full resolution of the area cladogram will come with recognition of synapomorphies of *S. robustum* plus *S. seychellanum*, and of the other two groups.

KEY TO THE SPECIES

Females

1. No scopuliform hairs on tarsi III.....2
 Scopula present but may be only thin and divided by setae on tarsi III.....
 *S. robustum*
2. Ocular area as wide in front as behind (Fig. 47).....3
 Ocular area clearly wider behind than in front (Fig. 21).....4
3. Rastellum completely absent, rastellar area without even thick short setae
 *S. seychellanum*
 At least two differentiated thick setae form weak rastellum (e.g., Fig. 29)
 *S. colemani*
4. Eye group about twice as wide in front as long or wider*S. pectinatum*
 Eye group clearly less than twice as wide in front as long (Fig. 21)
 *S. maculatum*

Males

1. Cuspules present on labium and maxillae.....*S. robustum*
 Cuspules absent on labium and maxillae.....2
2. Teeth present on paired claws.....*S. colemani*
 Teeth absent on paired claws.....*S. andamanicum*

Sason andamanicum (Simon)

Figs. 3-9 Table 1

Satzicus andamanicum Simon 1888:287.

Sason andamanicum: Simon 1892:130.

Type.—Holotype male, Andaman Is., Port Blair (R. D. Oldham, MNHNP No. 9763, examined).

Diagnosis.—Differs from *S. colemani* by the absence of teeth on the paired claws of the male and a rastellum.

Fovea recurved. Rastellum absent. Cuspules absent on maxillae and labium of male. Scopulae thin, ventral, divided by scattered setae on tarsi III, rudimentary on tarsus IV; few distal scopuliform hairs on metatarsi III. Tibia I of male with

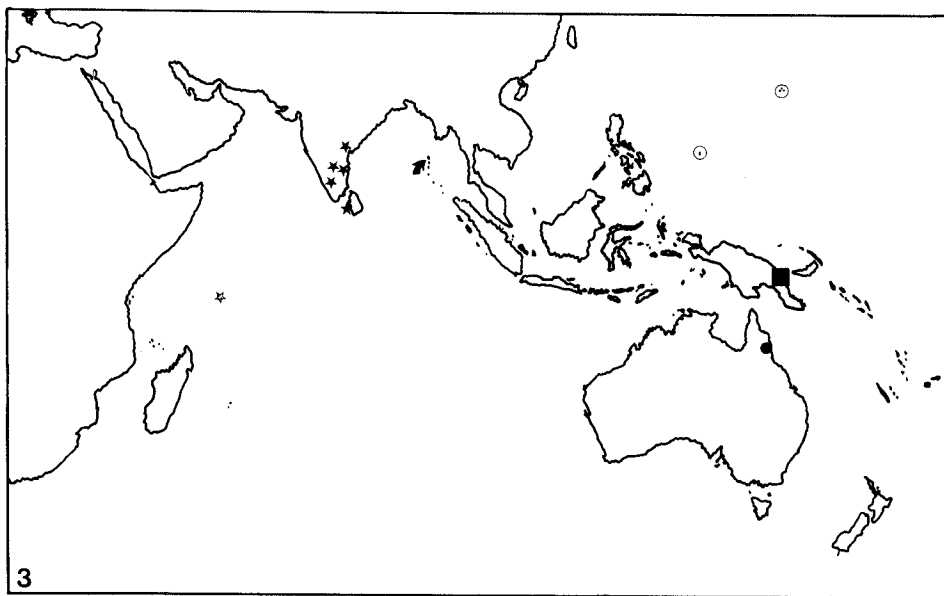


Fig. 3.—Map showing distribution of *Sason* species. Symbols (from left): *S. seychellianum* (star), *S. robustum* (black star); *S. andamanicum* (arrow); *S. maculatum* (hollow circle); *S. pectinatum* (solid square); *S. maculatum* (dot).

prolateral distal spinose process directed entally. Palpal bulb squat. Spines present on femur and tibia I. Paired claws without teeth. Females unknown.

Description.—Holotype male MNHNP No. 9763. Carapace 5.00 long, 4.75 wide. Abdomen 4.67 long, 3.42 wide.

Color in alcohol: carapace yellow brown with slight brown mottling on caput; legs with faded pattern, without brown annulations, probably faded; abdominal pattern faded. The leg annulations characteristic of *Sason* may be absent because the type was in poor condition when first described.

Carapace: fovea broad, recurved. Bristles: about 20, long, erect on clypeal edge; 5 anteromedian; numerous long, erect, and thick, forming uniform covering on caput and interstrial ridges. Eyes: all but ALE on low tubercle; 1, 3; 2, 0.49; 3, 73:77:39; 4, 24:17:9:12; 5, 52:56:31; 6, 7, 11, 23, 45, 2, 43. Chelicerae: long bristles in two narrow dorsal bands; rastellum absent; 7 spaced promarginal teeth, 1 small basomesal tooth on furrow.

Labium: 0.44 long, 0.88 wide; without cuspules. Maxillae: 1.20 long in front, 1.60 long behind, 0.72 wide; without cuspules. Sternum: 2.88 long, 2.28 wide; only posterior and middle sigilla evident.

Legs: (Table 1). 413. Scopulae: thin, ventral, divided by scattered setae on tarsus III; rudimentary on tarsus IV; metatarsus III with few distal scopuliform hairs; tibia I with predistal prolateral process bearing entally directed megaspine. Spines. Leg 1: fe, d2; ti, v4 + megaspine. Leg 2, missing. Leg 3, 0. Leg 4: fe, d4. Palp, 0. Claws: bare. Trichobothria: 1, 10 for half; 2, 10 in distal one-third; 3, 6 c. and 6 f. Palp: bulb squat, pyriform, with narrow tapering embolus.

Spinnerets: 1, 0.34; 2, 0.14; 3, 0.14; 4, 0.72; 5, 0.22; 6, 0.12; 7, 1.06.

Distribution.—*S. andamanicum* is known only from the Andaman Islands in the Bay of Bengal.

Material examined.—Only the type.

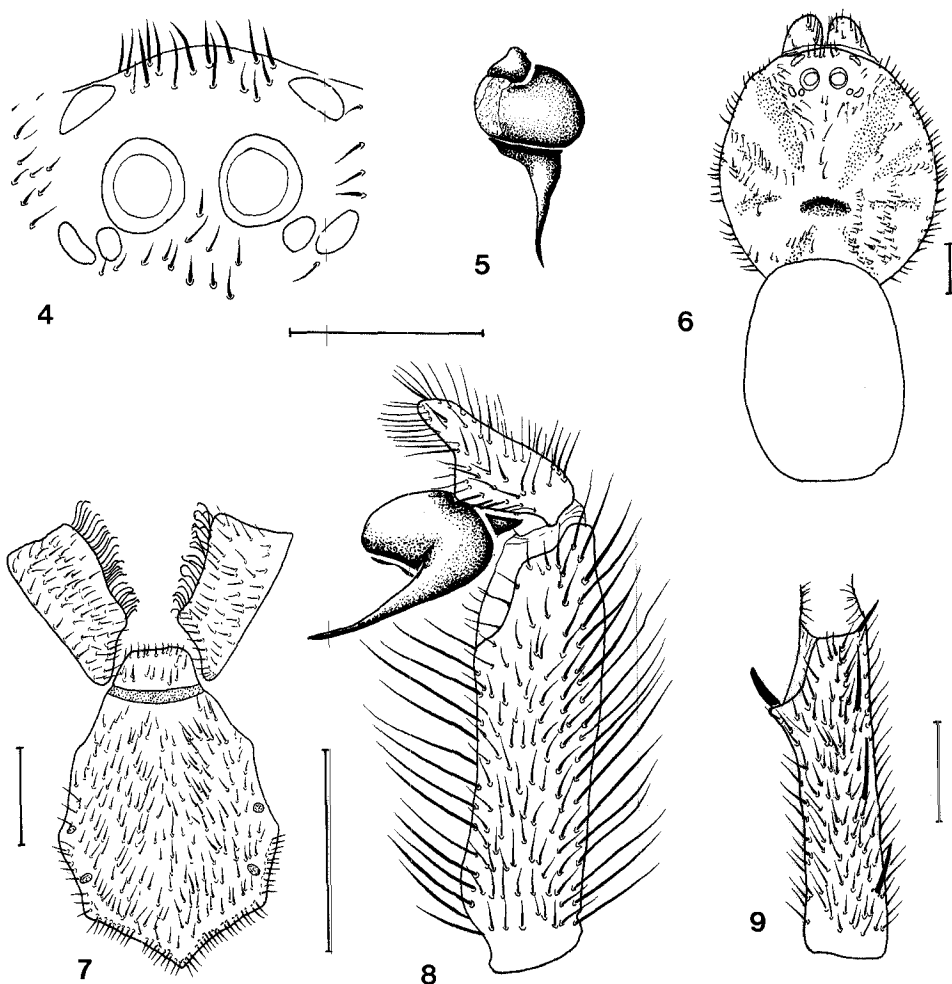


Fig. 4-9.—*Sason andamanicum* Simon, holotype male: 4, eyes, dorsal view; 5, palpal bulb, ventral view; 6, cephalothorax and abdomen, dorsal views; 7, sternum, maxillae, and labium; 8, palpal tibia, cymbium, and bulb, retrolateral view; 9, tibia I, ventral view. All scale lines, 1 mm.

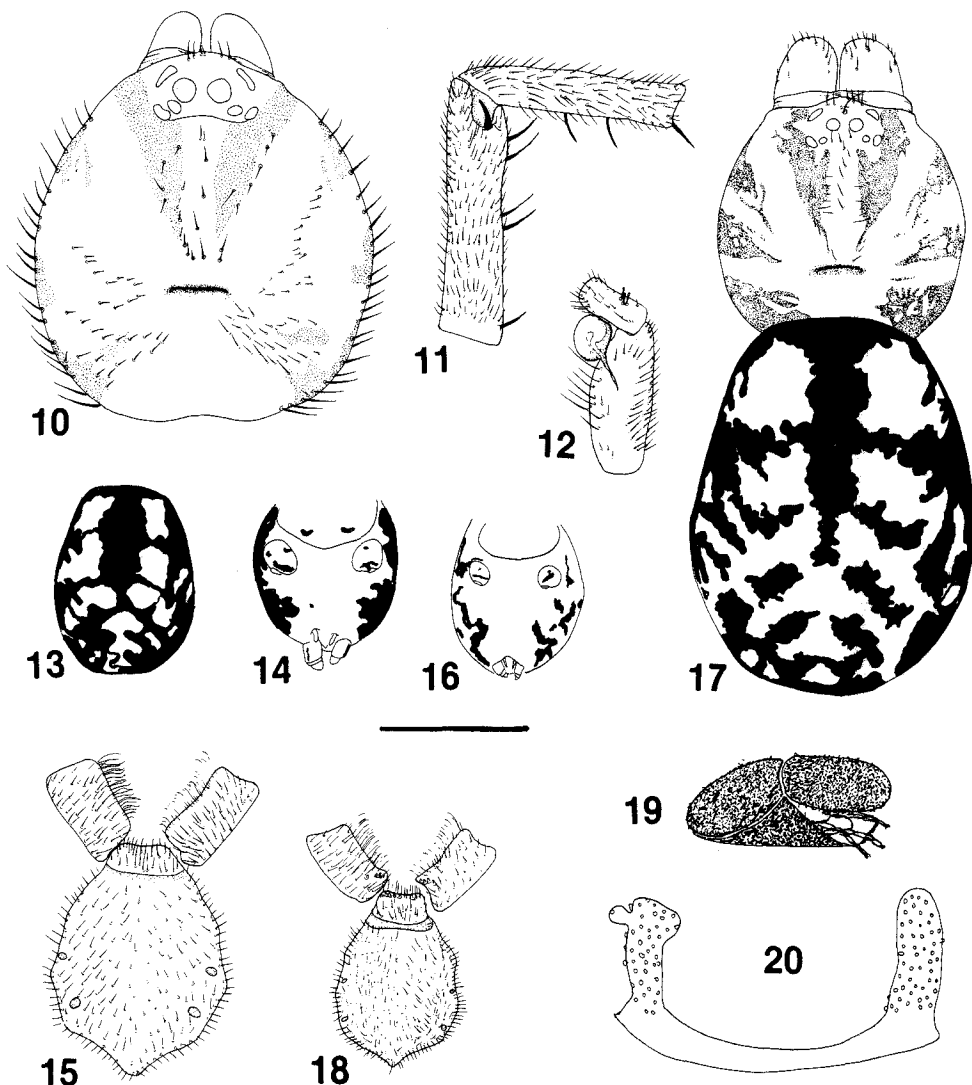
***Sason colemani*, new species**

Figs. 3, 10-20 Table 2

Types.—Holotype male, paratype female. Australia: Queensland: Cairns, in swamp on trees in short tubes covered by bark particles (17.xi.1980, N. C. Coleman, QM S 1311, 1312); female paratype, same data (QM S 1313).

Table 1.—Leg measurements of *Sason andamanicum*. Legs 2 are missing. Values are for holotype male.

	Leg 1	Leg 3	Leg 4	Palp
Femur	4.83	4.25	5.33	2.58
Patella	2.75	2.33	2.83	2.08
Tibia	3.50	3.50	5.00	2.08
Metatarsus	2.75	3.00	3.92	
Tarsus	1.50	1.33	1.50	0.67
Total	15.33	14.41	18.58	6.91



Figs. 10-20.—*Sason colemani*, new species, holotype male, paratype female: 10-15, male; 10, cephalothorax, dorsal view; 11, tibia and metatarsus I, prolateral view; 12, palpal tibia, cymbium, and bulb, retrolateral view; 13, 14, abdomen, dorsal view (13), ventral view (14); 15, sternum, maxillae, and labium; 16-20, female; 16, abdomen, ventral view; 17, cephalothorax and abdomen, dorsal view; 18, sternum, maxillae, and labium; 19, nest showing two doors; 20, spermathecae. Scale line: figs. 10-12, 15-18 = 1 mm; figs. 13, 14, 16 = 2 mm; fig. 19 = 5 mm; fig. 20 = 0.5 mm.

Diagnosis.—Differs from *S. andamanicum* by the presence of teeth on the claws of the male, two coniform rastellar spines, and more spines on the legs.

Fovea almost straight. Rastellum consists of 2-3 coniform spines. Scopulae in females divided on metatarsi and tarsi I, II; absent on metatarsi and tarsi III, IV of males and females. Tibia I of males with prolateral and distal megaspine on low ectally directed spur. Palpal bulb pyriform. Spines present on femora I-IV and tibiae I and II of males, and ventral patellae and metatarsi I, II of females.

Description.—Holotype male QM S 1311. Carapace 2.43 long, 2.28 wide. Abdomen 2.50 long, 1.95 wide.

Color in alcohol: carapace light brown with darker brown areas near eyes, on caput, and interstrial ridges; chelicerae cream with brown areas; abdomen dorsally brown with large white paired areas medially forming two large and small lateral pairs in median triangular area, with irregular white spots posteriorly; ventrally cream with small brown areas on booklung covers and laterally; sternum edge brown; legs cream coloured with brown annulations on distal and lateral femora, prolateral patellae, tibial joints, and distal metatarsi.

Carapace: fovea shallow, centrally placed, broad, transverse almost straight with slightly recurved ends. Bristles: short curved in fringe on lateral margins, posterior interstrial ridges, and few on anterior ridges; 5 thick anteromedian; 6 on clypeal edge; 1 long between AME; several between PME. Eyes: tubercle low; 1, 2; 2, 0.62; 3, 33:35:18; front row strongly procurved, back row recurved; 4, 7:9:4:5; 5, 19:25:12; 6, 3, 3, 6, 20, 1, 15. Chelicerae: short, almost glabrous; rastellum consists of two distinct coniform bristles distally; 6-7 teeth on promargin, no teeth or granules visible elsewhere.

Labium: 0.18 long, 0.50 wide; separated from sternum by shallow groove; cuspules absent. Maxillae: 0.53 long, 0.30 wide; cuspules absent. Sternum: 1.30 long, 1.18 wide; posterior sigilla round, marginal, 0.06 across; other sigilla not discernible.

Legs: (Table 2). 4123. Scopulae: present but very thin on short shiny tarsi and metatarsi I, II; entirely absent on metatarsi and tarsi III, IV. Tibia I with small megaspine on low mound prolaterodistally. Spines. Leg 1: fe, d2; pa, v2; ti, p2 v6 + megaspine; me, v4. Leg 2: ti, v6. Leg 3: fe, d3. Leg 4: fe, d5. Palp: pa, v1. Claws: three teeth on ental edge of both claws on legs I; long curved with two teeth on leg IV. Trichobothria: 1, 2-5 for half; 2,6; 3, 7-9 c. and f. Palp: bulb spheroidal; embolus tapers to point, grooves absent.

Spinnerets: 1, 0.13; 2, 0.08; 3, 0.03; 4, 0.28; 5, 0.13; 6, 0.08; 7, 0.49.

Paratype female QM S 1312. Carapace 1.90 long, 1.64 wide. Abdomen 4.88 long, 3.75 wide.

Color in alcohol: carapace, dorsal abdomen, and legs similar to male but with more distinct pattern; carapace pattern darker with paler areas behind eye group; abdomen ventrally pallid with brown areas laterally and medially between posterior booklungs; sternum entirely pallid.

Carapace: fovea broad, straight. Bristles: in three lines anterior to fovea; 3 very long thick anteromedian; 1 long between AME; 2 long between PME; 6 on clypeal edge. Eyes: not on tubercle; 1, 2; 2, 0.47; 3, 24:26:13; front row strongly procurved, back row slightly recurved; 4, 8:10:5:7; 5, 12:17:9; 6, 3, 3, 5, 14, 1, 12. Chelicerae: short, geniculate, pallid with fine brown hairs; rastellum consists of 2-3 coniform spines distally; 5 thick teeth, 5-7 granules basomesally on promargin.

Labium: 0.75 long, 0.40 wide; 9 thick pointed cuspules. Maxillae: 0.70 long, 0.55 wide; with 5-6 cuspules on inner edge, and thin spinules posteriorly. Sternum: 1.90 long, 1.63 wide; posterior and middle sigilla evident as small paired depressions.

Legs: (Table 2). 4123. Scopulae: distinct but thin, divided on metatarsi and tarsi I, II; entirely absent on metatarsi and tarsi III, IV. Spines. Femoral 'spines' are long, thick, curved bristles. Leg 1: fe, p1 d3; pa, v1; ti, v3; me, v1. Leg 2: fe, d3; pa, v1; ti, v3; me, v2. Leg 3: fe, d3. Leg 4: fe, d3. Palp: fe, d2 pa, v2; ti,

Table 2.—Leg measurements of *Sason colemani*. Values are for holotype male with allotype female in parentheses.

	Leg 1	Leg 2	Leg 3	Leg 4	Palp
Femur	2.28(1.72)	2.24(2.16)	2.08(2.04)	2.32(2.72)	1.05(1.48)
Patella	1.32(1.52)	1.16(1.20)	1.08(1.28)	1.02(1.72)	0.75(1.20)
Tibia	1.76(1.40)	1.72(1.40)	1.64(1.40)	2.32(2.36)	0.83(1.00)
Metatarsus	1.56(1.08)	1.48(1.00)	1.40(1.20)	1.84(1.60)	
Tarsus	0.76(0.64)	0.68(0.76)	0.68(0.60)	0.68(0.72)	0.48(1.04)
Total	7.68(6.36)	7.28(6.52)	6.88(6.52)	8.18(9.12)	3.11(4.72)

v6. Claws: long curved, without teeth. Trichobothria: 1, 5-8 for half; 2, 5-6; 3, 4-6 c. and 9 f.

Spinnerets: 1, 0.20; 2, 0.08; 3, 0.20; 4, 0.33; 5, 0.18; 6, 0.08; 7, 0.61. Spermathecae: each a short lobe with or without small, distal, ectal lobe.

Distribution, Habitat, and Remarks.—*S. colemani* is known only from a natural swamp in the Botanical Gardens in Cairns, north Queensland. The retreat consists of a very short tube with a door at each end (Fig. 19); as one door opens the other is pressed closed. Retreats were found on the bark of trees. Two other barychelid genera, *Cyphonisia* and *Paracenobiopelma*, make similar but slightly longer retreats with more distance between the door hinges (Blandin and Célérrier 1977, Feio 1952). The similar retreat is probably another synapomorphy of *Sason* and *Paracenobiopelma*.

Material examined.—Only the types.

Sason maculatum (Roewer)

Figs. 3, 21-26 Table 3

Chrysopelma maculata Roewer 1963:113, figs. 3d-f. **NEW COMBINATION.**

Types.—Holotype female, Korori, Palau Island (26.xi.1947, H. Y. Dybas, USNM, examined). Paratypes: female, Palau Island (August 1945, H. Y. Dybas, SMF No. 12758); female, Ponape (March 1948, H. F. Dybas, deposition unknown).

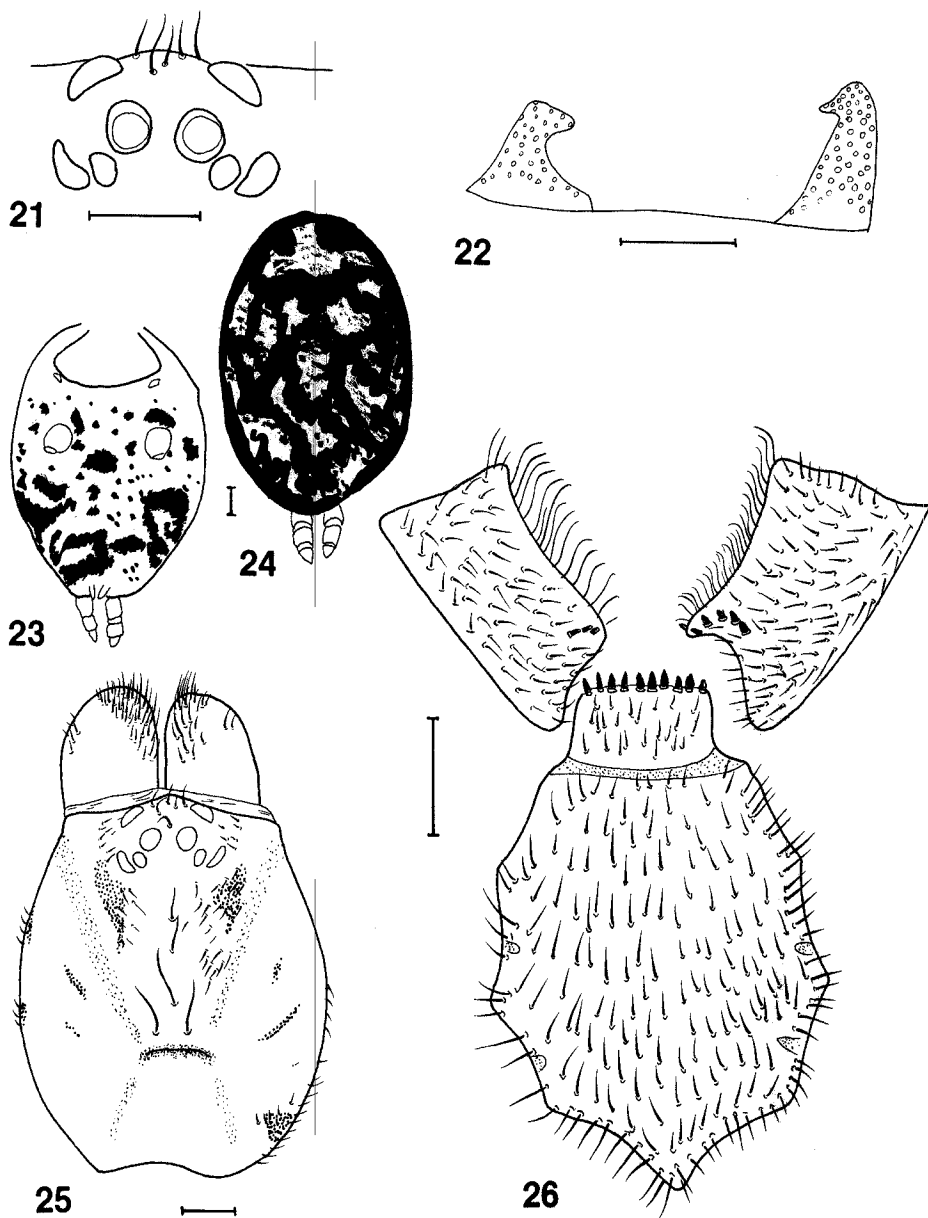
Diagnosis.—Differs from *S. pectinatum* in the relatively longer eye group.

Fovea broad with recurved ends. Rastellum consists of two coniform spines. Scopulae in females absent on metatarsi and tarsi III, IV. Spines present on all femora, and tibiae and metatarsi III, IV. Eye group about 1.5 times wider in front than long, and clearly wider behind than in front.

Description.—Paratype female SMF No. 12758. Supplementary description to Roewer 1963. Carapace 3.78 long, 2.72 wide. Abdomen 5.42 long, 3.58 wide.

Color in alcohol: carapace yellow brown with small brown areas on caput and lateral margins; narrow brown areas radiating from fovea along interstrial ridges; chelicerae yellow brown; legs yellow brown with large brown spots on posterior femora I, II, prolateral and retrolateral on femora III, IV, prolaterally on patellae and tibiae I, II, and dorsally on metatarsi I-IV; lateral brown markings on patellae and tibiae III, IV; abdomen dorsally brown with large irregular brown spots, ventrally fawn with brown markings posteriorly.

Carapace: fovea broad, straight with recurved ends. Bristles: one foveal pair; 3 posteriorly directed pairs in front of fovea; several on lateral caput; 1 long



Figs. 21-26.—*Sason maculatum* (Roewer), paratype female: 21, eyes, dorsal view; 22, spermathecae; 23, 24, abdomen, ventral view (23), dorsal view (24); 25, cephalothorax, dorsal view; 26, sternum, maxillae, and labium. Scale lines, 0.5 mm, except Fig. 22, 0.1 mm.

between AME; 5 long, curved between ALE. Eyes: not on tubercle; 1, 2; 2, 0.51; 3, 42:50:28; front row strongly procurved, back row slightly recurved; 4, 12:12:7:10; 5, 25:34:18; 6, 5, 6, 11, 21, 1, 22. Chelicerae: sparse bristles on prodorsum; rastellum consists of 2 coniform spines medially on distal edge; 6 large and one small tooth, several small granules basomesally on promargin.

Labium: 0.66 long, 0.38 wide; with 10 blunt cuspules. Maxillae: 0.90 long in front, 1.20 long behind, 0.52 wide; with 4-6 cuspules. Sternum: 1.84 long, 1.48 wide; all sigilla oval, touching margin.

Table 3.—Leg measurements of *Sason maculatum*. Values are for paratype female.

	Leg 1	Leg 2	Leg 3	Leg 4	Palp
Femur	2.08	2.16	1.84	2.60	1.60
Patella	1.56	1.52	1.28	1.64	1.24
Tibia	1.36	1.32	1.32	2.00	1.00
Metatarsus	1.00	1.08	1.20	1.68	
Tarsus	0.72	0.64	0.64	0.84	1.08
Total	6.72	6.62	6.28	8.76	4.92

Legs: (Table 3). 4123. Scopulae: entirely absent on metatarsi and tarsi III, IV. Spines. Leg 1: fe, d5; ti, v5. Leg 2: fe, d5; pa, v1; ti, v5. Leg 3: fe, d5; ti, v7. Leg 4: fe, d5; ti, v4; me, v6. Palp: fe, d3; pa, v3; ti, v7. Claws: palpal claw short with two small teeth; others without teeth. Trichobothria: 1, 5-6 for half; 2, 6; 3, two divided bands of 4-6 c., 8 f.

Spinnerets: 1, 0.20; 2, 0.10; 3, 0.16; 4, 0.42; 5, 0.38; 6, 0.14; 7, 0.94. Spermathecae: each receptaculum with short lateral lobe.

Distribution.—*S. maculatum* is known only from Saipan in the Marianas, and Kusaie, Ponape, Truk, and Woleai in the Caroline atolls, north of New Guinea.

Material examined.—Only the types.

Sason pectinatum Kulczyński

Figs. 3, 27-29

Sason pectinatum Kulczyński 1908:450.

Type.—Holotype juvenile, northeastern New Guinea (1896, L. Biró. Museu Nationalis Hungarici, examined).

Diagnosis.—Differs from *S. pectinatum* in the comparatively wider eye group and stronger spines on legs I, II.

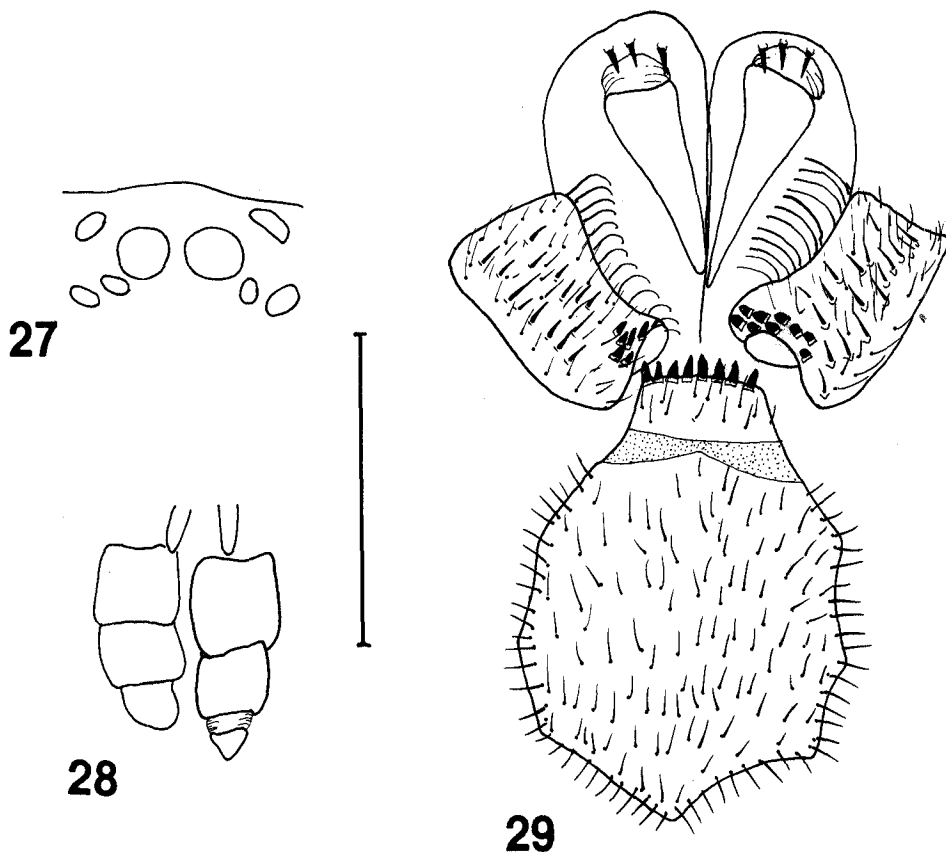
Fovea recurved. Rastellum consists of one or two spines. Scopulae of females absent on metatarsi and tarsi III, IV. Spines only on femora to metatarsi I, II, and femora and metatarsi III, IV. Eye group about twice as wide in front as long, slightly wider behind than in front. Palpal claw with one or two small teeth. Adults unknown.

Description.—Carapace 2.04 long, 1.80 wide. Abdomen 2.68 long, 1.84 wide.

Color in alcohol: carapace yellow brown with some faded areas on caput and lateral margins; chelicerae yellow brown; legs yellow brown with faded annulations on all patellae, tibiae, and metatarsi; abdominal pattern faded, only medial brown area evident; ventrally pallid, also with no pattern.

Carapace: bristles: 3 anteromedian; 2 long, curved between ALE. Fovea broad, straight. Eyes: not on tubercle; 1, 2; 2, 0.48; 3, 34:37:16; front row procurved, back row slightly recurved; 4, 8:8:5:4; 5, 21:26:12; 6, 3, 3, 8, 21, 2, 18. Chelicerae: bristles sparse on prodorsum; rastellum consists of 1 or 2 coniform spines medially on distal edge; promargin with 6 large and one small tooth, 6-8 small teeth basomesally.

Labium: 0.24 long, 0.48 wide; with one small, blunt and nine pointed cuspules. Maxillae: 0.56 long in front, 0.70 long behind, 0.38 wide; with 7-12 cuspules. Sternum: 1.24 long, 1.08 wide; sigilla not evident.



Figs. 27-29.—*Sason pectinatum* Kulczyński, holotype juvenile: 27, eyes, 28, spinnerets, ventral view; 29, chelicerae, sternum, maxillae, and labium, ventral view. Common scale, 1 mm.

Legs. 4123. Scopulae: entirely absent on metatarsi and tarsi III, IV. Spines: strong ventrally on legs I, II. Leg 1: pa, v1; ti, v5; me, v1. Leg 2: fe, d3; pa, v1; ti, v5; me, v1. Leg 3: fe, d5; me, v3 (weak). Leg 4: fe, d4; me, v2 (weak). Palp: fe, proventral 2; pa, p2, v1; ti, v6. Claws: palpal claw short with one or two small teeth; others without teeth. Trichobothria: similar to *S. maculatum*.

Spinnerets: 1, 0.16; 2, 0.06; 3, 0.08; 4, 0.24; 5, 0.20; 6, 0.10; 7, 0.50. Spermathecae: not evident.

Distribution and Remarks.—*S. pectinatum* is known only from north-eastern New Guinea. Because the type is a juvenile, the above description and figures are less informative than those of mature specimens, and no leg measurements are given.

Material examined.—Only the type.

Sason robustum (O. P.-Cambridge)

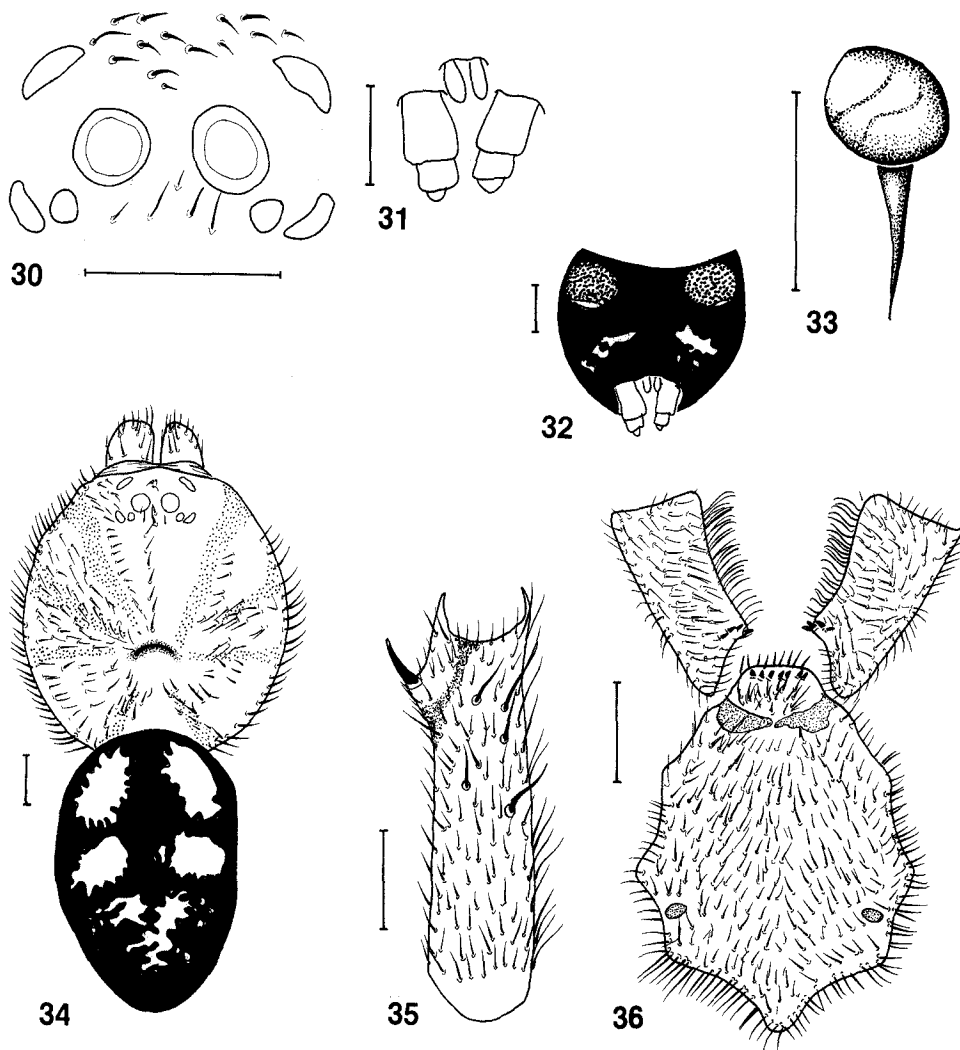
Figs. 1-3, 30-45 Table 4

Sarpedon robustum O. P.-Cambridge 1883:354, plate 36, fig. 1a-f.

Sason robustum Karsch 1891:273; Simon 1892:129, 130; Pocock 1900:173.

Oecophloeus cinctipes Pocock 1892c:49, pl. III, figs. 1, 2 (syntype female, Ceylon, Punduloya River,

E. E. Green, BMNH No. 1890.10.22.70, examined; female syntype, Kanthalai, BMNH No.



Figs. 30-36.—*Sason robustum* (O. P.-Cambridge), male: 30, eyes, dorsal view; 31, spinnerets, ventral view; 32, abdomen, ventral view; 33, palpal bulb, ventral view; 34, cephalothorax and abdomen, dorsal view; 35, tibia I, ventral view; 36, sternum, maxillae, and labium. All scale lines, 1 mm.

1898.3.21.3, examined; female and juvenile syntypes, Madras Jambunathan, BMNH No. 1923.xii.21.33-34, examined). **NEW SYNONYMY.**

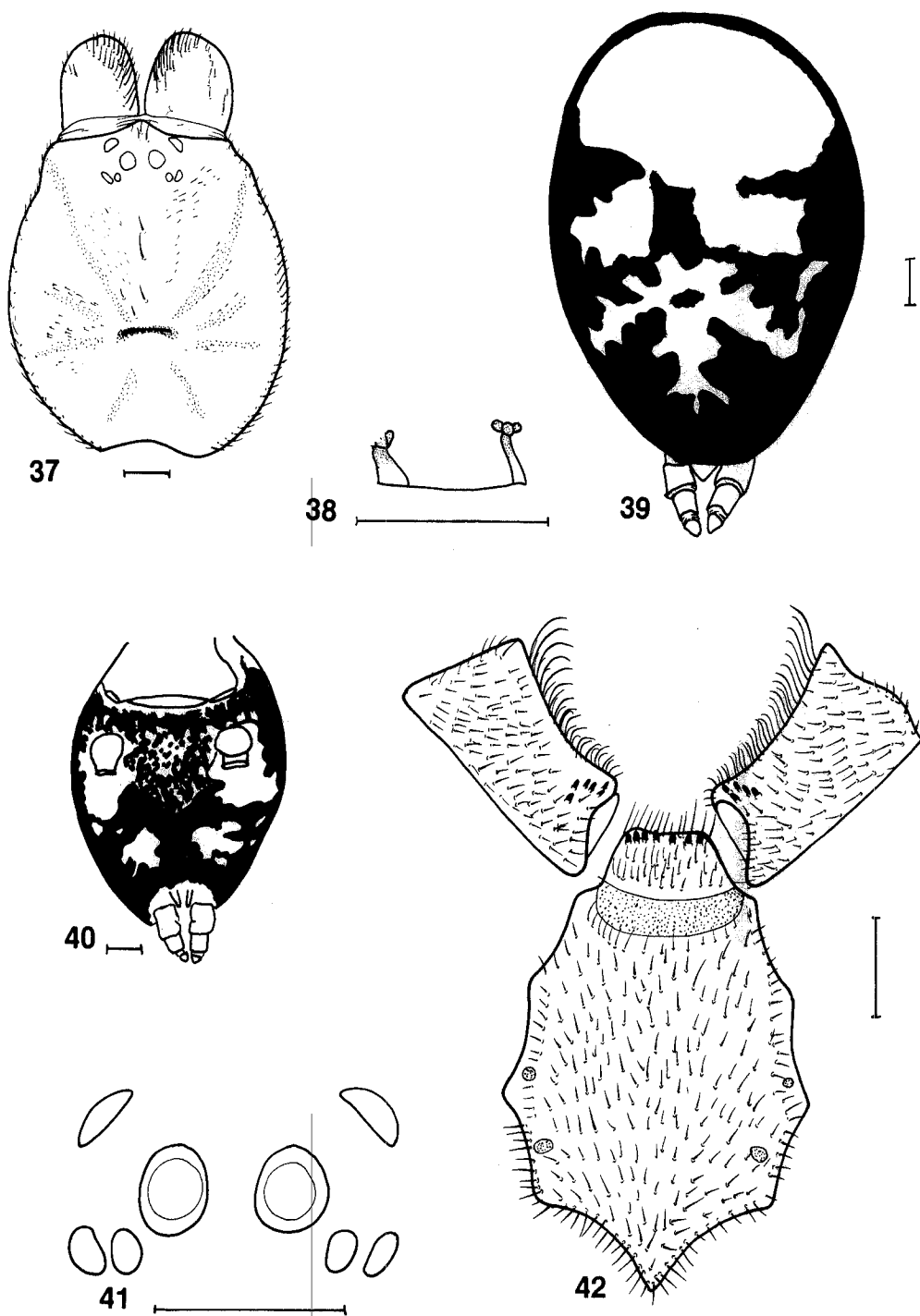
Sason cinctipes: Simon 1892:130; Pocock 1904:799.

Sason armatoris Pocock 1900:173; fig. 56 (syntype male, south western India, Travancore, Ponmudi, coll. Fergerson, BMNH No. 1899.7.11.6, examined; male, Trevandrum, Feb. 1896, BMNH No. 1899.1.17.1). **NEW SYNONYMY.**

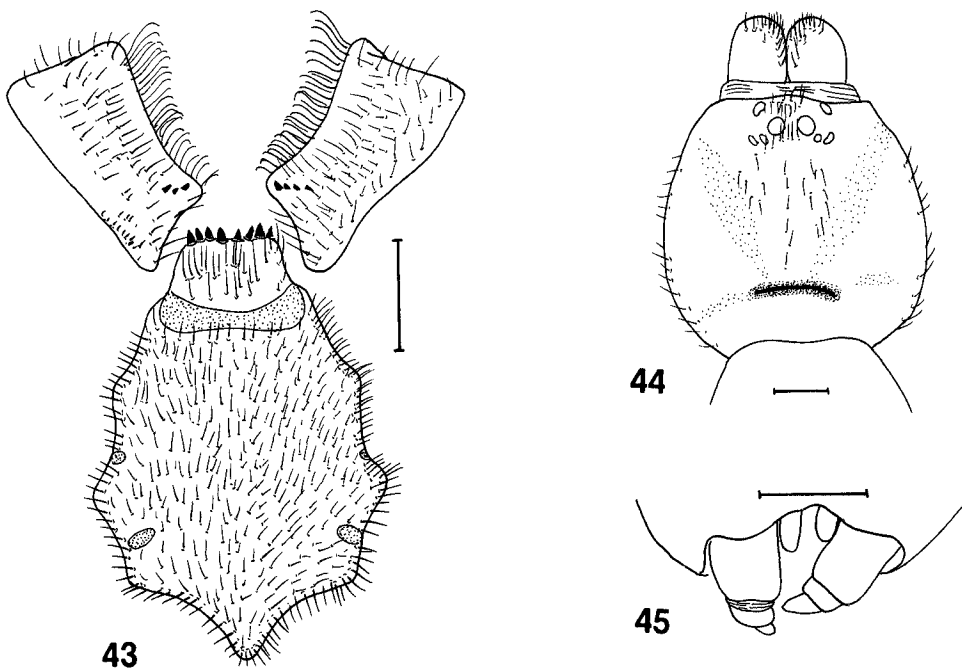
Type.—Lectotype female and paralectotype juvenile, Ceylon (G. H. K. Thwaites, Hope Museum, Oxford, examined and here designated).

Diagnosis.—*S. robustum* females differ from those of other *Sason* species by the absence of scopula on tarsus IV; males differ from those known of other species by the presence of cuspules on the maxillae and labium.

Fovea broad, recurved. Rastellum absent. Scopulae: in females, distal, thin on metatarsus III, sometimes absent on IV; thin but divided by broad setal band on



Figs. 37-42.—*Sason robustum* (O. P.-Cambridge), female: 37, cephalothorax, dorsal view; 38, spermathecae; 39, 40, abdomen, dorsal view (39), ventral view (40); 41, eyes, dorsal view; 42, sternum, maxillae, and labium. All scale lines, 1 mm.



Figs. 43-45.—*Sason robustum* (O. P.-Cambridge), holotype female: 43, sternum, maxillae, and labium; 44, cephalothorax and anterior abdomen, dorsal view; 45, spinnerets, ventral view. All scale lines, 1 mm.

tarsus III, sometimes absent on IV; in males, divided by narrow band of setae on tarsi III, absent on tarsi IV and metatarsi III, IV. Tibia I of males with proventral process and spur. Palpal bulb spheroidal with distinctly demarcated embolus. Spines present or absent on all femora and tibiae of males and females.

Description.—Male BMNH No. 1899.7.11.6. Carapace 4.64 long, 4.56 wide. Abdomen 4.00 long, 3.75 wide.

Color in alcohol: carapace orange brown with brown radial marks; chelicerae similar with darker areas; abdomen, dorsally brown with 3 paired white areas and three brown inverted V's, ventrally mottled with yellow brown booklung covers; laterally brown. Legs with pattern faded, ?without brown annulations.

Carapace: fovea broad, recurved. Bristles: thinly distributed, short, brown; in one row on lateral margins; 4, thick anteromedian. Eyes: on low tubercle; 1, 3; 2, 0.48; 3, 64:70:39; 4, 19:14:8:11; 5, 45:49:29; 6, 7, 10, 21, 40, 2, 37. Chelicerae: short, geniculate; stiff, long bristles dorsally; rastellum absent; 1 small and 5 thick teeth on promargin.

Labium: 0.40 long, 0.96 wide; 6 pointed cusps anteriorly. Maxillae: 1.20 long in front, 1.64 long behind, 0.76 wide; with 2 pointed cusps. Sternum: 2.84 long, 2.08 wide; only posterior and middle sigilla evident—both pairs oval, marginal.

Legs: (Table 4). 4123. Scopulae: distal two-thirds of metatarsi I, II; divided by narrow setal band on tarsus III; absent on metatarsi III, IV and tarsus IV. Tibia I with low prolateral spur set back from cuticle edge. Spines: Leg 1: fe, pl d3; ti, v4 + megaspine. Leg 2: fe, pl d3; ti, v5. Leg 3: fe, pl d6 r1. Leg 4 missing. Palp: fe, pl d3; ti, v2. Claws: two small teeth on legs I, II; bare on leg III.

Table 4.—Leg measurements of *Sason robustum*. Values are for holotype female with MNHNP male in parentheses.

	Leg 1	Leg 2	Leg 3	Leg 4	Palp
Femur	3.04(4.83)	3.20(5.08)	3.04(4.67)	4.40(5.83)	2.48(2.83)
Patella	2.24(3.33)	2.48(3.08)	1.92(2.67)	2.80(3.33)	1.84(1.92)
Tibia	1.92(3.92)	2.08(4.17)	2.16(4.00)	3.28(5.17)	1.68(2.42)
Metatarsus	1.52(3.83)	1.28(3.83)	1.84(3.75)	2.56(4.67)	
Tarsus	1.20(2.00)	1.04(1.83)	0.88(1.67)	1.12(2.00)	1.76(1.00)
Total	8.92(17.91)	9.09(17.99)	9.84(16.76)	14.16(21.00)	7.76(8.17)

Trichobothria: 1, 10 for half; 2, 12; 15-20 c. and f. Palp: bulb squat, pyriform, with narrow tapering embolus.

Spinnerets: 1, 0.20; 2, 0.08; 3, 0.08; 4, 0.20; 5, 0.12; 6, 0.08; 7, 0.40.

Lectotype female Hope Entomological Collections, Oxford. Carapace 4.83 long, 4.17 wide. Abdomen 6.00 long, 4.58 wide.

Color in alcohol: carapace, chelicerae, and legs yellow brown; brown annulations on proximal tibiae I-IV, and distal metatarsi and tarsi. Abdominal pattern faded.

Carapace: Bristles: long, numerous on caput, fewer on thoracic region; 4 between AME; 4 long anteromedian; 2 long, several short on clypeal edge. Eyes: not on tubercle; 1, 3; 2, 0.43; 3, 76:79:39; 4, 16:15:9:11; 5, 46:61:25; 6, 13, 13, 19, 45, 3, 54. Chelicerae: small, geniculate; rastellum absent; 7 thick teeth on promargin, 4 granules basally.

Labium: 0.64 long, 1.16 wide; 8 thick pointed cuspules. Maxillae: 1.64 long in front, 2.12 long behind, 0.92 wide; 5 blunt cuspules on inner edge, thin spinules posteriorly. Sternum: 3.20 long, 2.76 wide; sigilloid depressions not evident.

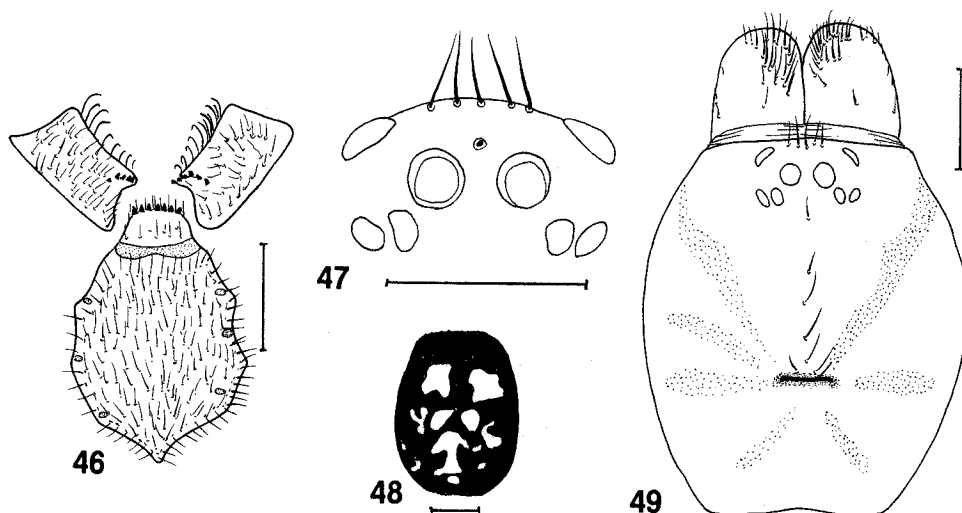
Legs: (Table 4). 4123. Scopulae: lateral and strongly divided by setae on tarsi III; absent on metatarsi III, IV and tarsi IV. Spines. Leg 1: pa, v1; ti, v5. Leg 2: pa, v1; ti, p1 v5. Leg 3: ti, v4. Leg 4: 0. Palp: pa, v3; ti, v6. Claws: 2-3 small teeth on single keel; palpal claw (of female MNHNP No. 15063) with one distinct tooth. Trichobothria: 1, 9; 2, 14; 13 f. and c.

Spinnerets: 1, 0.36; 2, 0.16; 3, 0.16; 4, 0.52; 5, 0.44; 6, 0.20; 7, 1.16. Spermathecae: not examined.

Distribution and Remarks.—*S. robustum* is known only from Ceylon and southern India. Pocock (1900), citing Simon (1892), diagnosed male *Sason* by the cuspule-free labia and maxillae. However, Simon appears to have overlooked the cuspules on the males in his collection and instead based his diagnosis of the genus on the male of *S. andamanicum*.

Synonymy.—*S. cinctipes* and *S. armatoris* differ from *S. robustum* only in having less dense or less extensive scopulae on metatarsi and tarsi III and IV, and also in having spines on the femora—differences that would indicate that *S. cinctipes* is a valid species. However, the differences are not congruent. The extent and density of scopula hairs are not correlated on metatarsi and tarsi III and IV. Thus, in the absence of males that have similar characteristics to females of *S. cinctipes* (spines on the femora and scopulae on metatarsi and tarsi III and IV) I conclude that only one species is present.

Material examined.—The types and the following: INDIA. female, 2 juveniles, Haragam (Aug. 1903, BMNH); female, south India, Yercaud, 1200 m (6.iii.1962, E. S. Ross and D. Cavagnaro, CAS); juvenile, 2.5 km south of Toppur, 340 m (3.iv.1962, E. S. Ross and D. Cavagnaro, CAS); female ?, Madras (8.iv.1962, E. S. Ross and D. Cavagnaro, CAS). CEYLON. female, Pundul Oya R. (E.



Figs. 46-49.—*Sason seychellanum* Simon, syntypes female: 46, 48, 49, ZMH specimen; 47, MNHNP specimen; 46, sternum, maxillae, and labium; 47, eyes, dorsal view; 48, abdomen, dorsal view; 49, cephalothorax, dorsal view. All scale lines, 1 mm.

E. Green, BMNH 1895.11.14.12.13; juvenile, (Dr. A. Willy, BMNH 1906. 11.14.4.6); female (Holdsworth collection, BMNH No. 1875.12); male, female (MNHNP No. 15963).

Sason seychellanum Simon

Figs. 3, 46-49 Table 5

Sason seychellanum Simon 1898:370; 1903:915; Hirst 1911:381; Benoit 1966:213; 1978:407, figs. 1a-d.

Types.—Lectotype female, Seychelle Islands (A. Brauer, 1895, ZMH, examined). Paralectotypes: juvenile male, juvenile female same data (in ZMH, examined); female, same data (MNHNP No. 15.220, examined). NEW DESIGNATIONS.

Diagnosis.—Differs from *S. andamanicum* by the complete absence of scopulae on legs III and IV, and more spinose legs.

Fovea more or less straight. Rastellum consisting of 3 coniform setae. Adult males unknown. Scopulae in females absent on metatarsi and tarsi III, IV. Paired claws of legs I, III with two teeth; palpal claw with 4 teeth.

Description.—Lectotype female ZMH. Carapace 3.92 long, 3.24 wide. Abdomen 3.42 long, 2.58 wide.

Color in alcohol [of MT 122.898]: carapace yellow with black margin and two roughly V-shaped areas on caput; femora with two brown areas distolaterally and I-IV also with pair at half length of femora; patellae with distolateral brown triangles; tibiae with three brown areas dorsally separated by two glabrous ovoid bands; metatarsi brown in distal one-third. Abdomen dorsally with three large white paired areas and posteriorly three irregular medial areas becoming smaller towards spinnerets; laterally mottled; ventrally pallid with incomplete transverse brown bands posteriorly.

Carapace: fovea broad, straight or very slightly procurved. Bristles: 5 on clypeal edge; 1 thick between AME; 1 foveal pair; 5 anteromedian; 3-4 groups

Table 5.—Leg measurements of *Sason seychellanum*. Values are for female MT.

	Leg 1	Leg 2	Leg 3	Leg 4	Palp
Femur	3.33	3.42	3.00	4.00	2.11
Patella	2.50	2.25	1.83	2.67	1.83
Tibia	2.33	2.25	2.33	3.17	1.83
Metatarsus	1.75	1.92	2.08	2.75	
Tarsus	1.25	1.42	1.25	1.42	1.75
Total	11.16	11.26	10.46	14.01	7.91

each of 4-5 on margins; few on cephalothorax. Eyes: not on tubercle; 1, 2; 2, 0.47; 3, 53:54:29; front row slightly procurved, back row straight; 4, 10:12:9:9; 5, 27:28:20; 6, 7, 10, 11, 33, 2, 26. Chelicerae: bristles sparse on prodorsum; rastellum not evident in ZMH but three distinct thorns in MT 122.898; 7 spaced teeth on promargin, 4-5 small teeth basomesally. Presumably the rastellar spines were damaged in the lectotype.

Labium: projects downward between maxillae; 0.36 long, 0.72 wide; 7 thick pointed cuspules. Maxillae: 1.00 long in front, 1.32 long behind, 0.64 wide; 7-8 cuspules in straight diagonal line. Sternum: 2.08 long, 1.80 wide; separated from labium by narrow shallow groove; all sigilla oval, about 0.08 long, and touching margin.

Legs: (Table 5). 4123. Scopulae: thin but entire on metatarsi and tarsi I, II; entirely absent on metatarsi and tarsi III, IV. Spines [from MT 122.898]: Leg 1: fe, d5; pa, v1; ti, v5. Leg 2: fe, p1 d5; pa, v1; ti, v6; me, v1. Leg 3: fe, d5; ti, v4; v3. Leg 4: fe, d5; ti, v3; me, v5. Palp: fe, p2 d3; pa, v4; ti, v7. Claws: 2 teeth on legs I, II; bare on leg IV; 4 long teeth on palpal claw. Trichobothria: 1, 7; 2, 5; 3, 13 c. and f.

Spinnerets: too inverted to measure. Spermathecae: two broad lobes narrowing and apically divided into two broad mounds (Benoit 1978, fig. 1d).

Distribution.—*S. seychellanum* is known only from the Seychelles.

Material examined.—The types and the following: Seychelles: female, Mahe, La Misère, 438m, mixed wet forest (P. L. G. Benoit and J. J. Van Mol, Mt 122.898); female, juvenile, Silhouette (Percy Sladen Trust expedition, BMNH 1910.5.1.2-3).

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